



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO.  |
|--|-------------|----------------------|---------------------|-------------------|
| 10/591,196   | 10/01/2007  | Kazunari Shinbo      | 1828.023            | 5896              |
| 23598  | 7590        | 07/09/2010           | EXAMINER            |                   |
| BOYLE FREDRICKSON S.C.<br>840 North Plankinton Avenue<br>MILWAUKEE, WI 53203 |             |                      |                     | LAPAGE, MICHAEL P |
| ART UNIT   |             | PAPER NUMBER         |                     |                   |
| 2886   |             |                      |                     |                   |
| NOTIFICATION DATE  |             |                      | DELIVERY MODE       |                   |
| 07/09/2010   |             |                      | ELECTRONIC          |                   |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@boylefred.com

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/591,196             | SHINBO ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Michael LaPage         | 2886                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 26 March 2010.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 15, 17-23, 25-30 and 33-44 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) 15, 17-20, 22, 23, 25-28, 30 and 33-44 is/are allowed.

6) Claim(s) 21 and 29 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ .  | 6) <input type="checkbox"/> Other: _____ .                        |

## DETAILED ACTION

1. Claims 15, 17-23, 25-30, 33-44 are presented for examination.
2. Claims 33-44 were added as new in amendment filed 07/21/2009.

### *Claim Objections*

3. Claim 20 is objected to because of the following informalities:
  - a. Claim 20, line 19, "provided in (square) said" needs correction in order to remove topographical error.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 21 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (U.S. PGPub No. 2008/0163688 A1) in view of Jorgenson et al. (U.S. PGPub No. 2006/0192955 A1).**

As to claim 21, Wang discloses and shows in figure 7 a substance adsorption detection method comprising:

providing a sensor (60) forming a metal layer (19, i.e. all though not shown due to a typographical error, based on the disclosure [0090] a metal layer is present in every embodiment of the disclosure of Wang) on a crystal oscillator (1", i.e. where the

examiner is interpreting “on” as being in optical communication with) or a surface acoustic wave element, said crystal oscillator comprising a crystal and electrodes (2', 3') formed on either face of said crystal ([107]; [0111]; [0114]),

measuring an adsorbed mass (i.e. binding reactions) with at least one of said crystal oscillator (1'') and said surface acoustic wave element, said crystal oscillator comprising a crystal and electrodes (2', 3') formed on either face of said crystal ([0026]; [0095]; [107]; [0113]; [0155]; [0156], where as is commonly known in the art SPR is done by measuring the change in index of refraction from the absorption of sample on the metal layer); and

Inputting light downward (i.e. where the examiner is interpreting the direction toward which the light propagates toward the metal layer as shown in figure 7 as downward as one of ordinary skill in the art can define any direction as downward without any frame of reference from which to base upward and downward off of) to said metallic layer (19, i.e. all though not shown due to a typographical error, based on the disclosure [0090] a metal layer is present in every embodiment of the disclosure of Wang) while a detection target substance adsorbs on said metallic colloid layer ([0153], [0155])

measuring an optical characteristic of said metallic colloid layer ([0129], [0130]; where inherently SPR is a measurement of surface plasmon waves present from absorption of a material on a metal layer as disclosed in Wang).

Wang does disclose and shows in figure 7 a sensor comprising: a crystal oscillator (1'') ([0096]; [0109])

Wang does not explicitly disclose where a metallic colloid layer formed on said crystal oscillator or said surface acoustic wave element.

However, Jorgenson does disclose in ([0017]) where thin gold films such as found in (Wang [0090]) can be exchanged with gold nanoparticles colloid layers in order to provide the advantage of increased sensitivity in a SPR sensor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wang by replacing the gold metal film with a gold colloid layer in order to provide the advantage of increased efficiency by increasing the sensitivity of the SPR sensing device.

As to claim 29, Wang does disclose and shows in figure 7 a sensor comprising: a crystal oscillator (1'') comprising a crystal and electrodes (2', 3') formed on either face of said crystal ([0096]; [0107]; [0109])

Wang does not explicitly disclose where a metallic colloid layer formed on said crystal oscillator or said surface acoustic wave element.

However, Jorgenson does disclose in ([0017]) where thin gold films such as found in (Wang [0090]) can be exchanged with gold nanoparticles colloid layers in order to provide the advantage of increased sensitivity in a SPR sensor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wang by replacing the gold metal film with a gold colloid layer in order to provide the advantage of increased efficiency by increasing the sensitivity of the SPR sensing device.

***Allowable Subject Matter***

6. Claim 15, 17-20, 22-23, 25-28, 30, 33-44 are allowed.

7. The following is an examiner's statement of reasons for allowance:

As to claims 17 and 25, the prior arts of record taken alone or in combination with any other references fail to teach or suggest the claimed apparatus or method wherein one of said **electrodes** is an optical waveguide electrode made of **an electrically conductive transparent material having a higher refractive index than a refractive index of said crystal**, said optical waveguide electrode serving as a **core** of said optical waveguide path.

As to claims 15, 17-18, 23, 25-26, 35-36 the prior arts of record taken alone or in combination with any other references fail to teach or suggest the claimed apparatus or method where providing **light inputting means** and **light emitting means** positioned on **end portions** of said **optical waveguide path** on which a detection target substance is adsorbed, wherein said light inputting means for allowing light to enter said core is provided on one end portion thereof and said light emitting means for acquiring light from said core is provided on the other end portion thereof; measuring an oscillation characteristic of said crystal oscillator and light transmitted on said optical waveguide path through said core while the light is **repeatedly reflected in said core**, said light being emitted through said light emitting means

As to claims 15, 17-18, 20, 23, 25-26, 28, 35-36 the prior arts of record taken alone or in combination with any other references fail to teach or suggest the claimed apparatus or method where providing **light inputting means** and **light emitting means**

positioned on **end portions** of said **optical waveguide path** on which a detection target substance is adsorbed, wherein said light inputting means for allowing light to enter said core is provided on one end portion thereof and said light emitting means for acquiring light from said core is provided on the other end portion thereof and measuring a propagation characteristic of said surface acoustic wave by said comb-like opposing electrodes in said surface acoustic wave element, and light guided through said core of said optical waveguide path provided in said surface acoustic wave element while the light is **repeatedly reflected in said core**, said light being emitted through said light emitting means.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

8. Applicant's arguments filed 07/21/2009 with respect to claims 21 and 29 have been fully considered but they are not persuasive.
9. As to applicant's argument with respect to the references of record not disclosing the newly amended features. The examiner respectfully disagrees and has cited in the primary reference of record Wang where the above noted features of electrodes on either side of the crystal as well as the way in which light impinges on the metallic colloid layer are disclosed. Therefore the instant claims 21 and 29 are subsequently still rejected over Wang et al. in view of Jorgenson et al.

***Conclusion***

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LAPAGE whose telephone number is (571)270-3833. The examiner can normally be reached on Monday Through Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on 571-272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael LaPage/  
Examiner, Art Unit 2886

/TARIFUR R CHOWDHURY/  
Supervisory Patent Examiner, Art Unit 2886